

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

LISTING OF CLAIMS:

1. (canceled)

2. (canceled)

3. (previously presented) A network system, comprising:

a terminal unit that sends an echo response with a predetermined counter value to the sender of a predetermined echo request;

an access server that couples said terminal unit through a communication line and routes data and said echo request to be communicated between said terminal unit and said access server, decrements a count value of the echo request every time repeating the echo request, and, when the count value becomes zero, sends an echo response to the sender of the echo request;

one or more routers that are connected to said access server and that routes data and said echo request to be communicated between said terminal unit and said routers, decrements a count value of the echo request every time repeating the echo request, and, when the count value becomes zero, sends an echo response to the sender of the echo request; and

an application server that is connected to any one of said routers, said application server comprising,

a first echo request sending means that sends a first echo request to said terminal unit,

a first echo response receiving means that receives a first echo response in reply to the first echo request from said terminal unit,

a first measuring means that measures a first round trip time as a data delay time between said terminal unit and said application server, said first round trip time being an elapsed time from send time of the first echo request until receive time of the first echo response,

an estimating means that estimates the number of routers up to said access server from a counter value of the first echo response received by said first echo response receiving means,

a second echo request sending means that sends a second echo request with a count value that is set to be the number of routers estimated by said estimating means to said terminal unit,

a second echo response receiving means that receives a second echo response in reply to the second echo request,

a second measuring means that measures a second round trip time as a data delay time between said access server and said application server, said second round trip time being an

elapsed time from send time of the second echo request until receive time of the second echo response,

a communication line delay calculating means that calculates a data delay time of said communication line from the first and second round trip times measured by said first and second measuring means, respectively,

a communication line bandwidth storing means that stores a bandwidth of said communication line corresponding to the data delay time of said communication line, and

a data sending means that sends data to said terminal unit according to the bandwidth of said communication line stored in said communication line bandwidth storing means corresponding to the data delay time calculated by said communication line delay calculating means.

4. (previously presented) A network system, according to claim 3, wherein:

said application server comprises,

an echo response judging means that judges whether the second echo response received by said second echo response receiving means is sent from said terminal unit or not, and

a re-sending means that, when said echo response judging means judges that the second echo response received by said second echo response receiving means is sent from said terminal unit, makes said second echo request sending means send another second echo request with a count value that is set to be

less than the number of routers estimated by said estimating means to said terminal unit.

5. (previously presented) A network system, according to claim 3, wherein:

said application server comprises a data sending means that, a data delay time of the communication line calculated by said communication line delay calculating means is larger than a predetermined threshold value, sends data to said terminal unit based on a bandwidth stored in said communication line bandwidth storing means in accordance with the data delay time, and, when the data delay time of the communication line calculated is smaller than the predetermined threshold value, sends data to said terminal unit at a maximum bandwidth in the communication line.

6. (previously presented) A network system, according to claim 4, wherein:

said application server comprises a data sending means that, a data delay time of the communication line calculated by said communication line delay calculating means is larger than a predetermined threshold value, sends data to said terminal unit based on a bandwidth stored in said communication line bandwidth storing means in accordance with the data delay time, and, when the data delay time of the communication line calculated is smaller than the predetermined threshold value, sends data to

said terminal unit at a maximum bandwidth in the communication line.

7. (previously presented) A network system, according to claim 3, wherein:

said terminal unit comprises,

a connection request sending means that sends a connection request to said application server prior to receiving data from said application server, and

a responding means that receives a connection approval in reply to the connection request as the first echo request and sends a response in reply to the connection approval as the first echo response; and

said application server comprises,

a transmitting means that sends the connection approval in reply to the connection request sent from said connection request sending means as the first echo request, and

a communication line setting means that receives the response sent from said responding means as the first echo response and sets up a communication line between said terminal unit and said application server.

8. (previously presented) A network system, according to claim 4, wherein:

said terminal unit comprises,

a connection request sending means that sends a connection request to said application server prior to receiving data from said application server, and

a responding means that receives a connection approval in reply to the connection request as the first echo request and sends a response in reply to the connection approval as the first echo response; and

said application server comprises,

a transmitting means that sends the connection approval in reply to the connection request sent from said connection request sending means as the first echo request, and

a communication line setting means that receives the response sent from said responding means as the first echo response and sets up a communication line between said terminal unit and said application server.

9. (previously presented) A network system, according to claim 5, wherein:

said terminal unit comprises,

a connection request sending means that sends a connection request to said application server prior to receiving data from said application server, and

a responding means that receives a connection approval in reply to the connection request as the first echo request and sends a response in reply to the connection approval as the first echo response; and

said application server comprises,

a transmitting means that sends the connection approval in reply to the connection request sent from said connection request sending means as the first echo request, and

a communication line setting means that receives the response sent from said responding means as the first echo response and sets up a communication line between said terminal unit and said application server.

10. (currently amended) A network system, comprising:

a communication line having a predetermined bandwidth;

a terminal unit that is connected to said communication line and receives data through the communication line;

a first unit that couples said terminal unit through said communication line and routes data to be communicated between said terminal unit and said first unit; and

a second unit that sends data to said terminal unit through said first unit according to the bandwidth of said communication line that is estimated based on a data delay time of said communication line,

wherein said second unit includes ~~a table that outputs the estimated bandwidth of said communication line based on an input that is the data delay time in said communication line,~~

a first measuring means that is connected to said first unit and measures a first round trip time as a data delay time between said terminal unit and said second unit,

a second measuring means that measures a second round trip time as a data delay time between said first unit and said second unit,

a communication line delay calculating means that calculates the data delay time of said communication line from said first and second round trip times measured by said first and second measuring means, respectively,

a communication line bandwidth storing means that stores a bandwidth of said communication line corresponding to the data delay time of said communication line, and

a data sending means that sends data to said terminal unit according to the bandwidth of said communication line stored in said communication line bandwidth storing means corresponding to the data delay time calculated by said communication line delay calculating means.

11. (currently amended) A network system, comprising:
a communication line having a predetermined bandwidth;
a terminal unit that is connected to said communication line and receives data through the communication line;

a first unit that couples said terminal unit through said communication line and routes data to be communicated between said terminal unit and said first unit; and

a second unit that sends data to said terminal unit through said first unit according to the bandwidth of said

communication line that is estimated based on a data delay time of said communication line,

wherein said second unit includes a first table that indicates whether said communication line is a narrow band line based on inputs of the data delay time in said communication line and a round trip time of data between said first unit and said second unit, and

wherein said second unit further includes a second table that outputs, when said first table indicates that said communication line is a narrow band line, a numerical estimate of the bandwidth of said communication line based solely on the data delay time in said communication line.

12-15. (canceled)